#### DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

# RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA750)

#### Migration of Contaminated Groundwater Under Control

Facility Name:	General Motors Powertrain-Defiance Facility					
Facility Address:	26427 State Route 281 East, Defiance, Ohio					
Facility EPA ID #:	OHD 005 050 273					
groundwater med	relevant/significant information on known and reasonably suspected releases to the lia, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units ated Units (RU), and Areas of Concern (AOC)), been <b>considered</b> in this EI determination?					
X	If yes - check here and continue with #2 below.					
	If no - re-evaluate existing data, or					
	if data are not available skip to #6 and enter "IN" (more information needed) status code.					
BACKGROUND						

# <u>Definition of Environmental Indicators (for the RCRA Corrective Action)</u>

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

#### Definition of AMigration of Contaminated Groundwater Under Control@ EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

#### **Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

#### **Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Is **groundwater** known or reasonably suspected to be **Acontaminated** above appropriately protective **A**levels (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

	If yes - continue after identifying key contaminants, citing appropriate Alevels,@and
_	referencing supporting documentation.

X If no - skip to #8 and enter AYE@ status code, after citing appropriate Alevels,@ and referencing supporting documentation to demonstrate that groundwater is not Acontaminated.@

If unknown - skip to #8 and enter AIN@status code.

# Rationale and Reference(s):

There are two saturated zones at the facility; a) the uppermost aquifer beneath the clay/till unit; and b) the shallow, or perched, essentially within the artificial fill above the clay/till unit, and wholly within the site boundary. The uppermost aquifer beneath the clay/till unit, is screened against MCL's and Drinking Water Equivalent Levels (DWEL) for constituents without MCL's.

The shallow perched zone, which is not a drinking water supply and is not currently or reasonably expected to be a future drinking water supply, and may discharge to the Maumee River, is evaluated using these same screening criteria after applying a dilution factor to account for groundwater mixing with surface water in the Maumee.

The dilution factor is derived by multiplying the MCL's and DWEL's by a factor that accounts for the mixing of groundwater from the shallow saturated zone with surface water in the Maumee River. This factor is  $\approx 1.5 \times 10^5$  and is calculated by dividing the River's harmonic mean flow at GM-Defiance ( $\approx 600 \text{ ft}^3/\text{s}$ ) by the ground-water discharge rate from the shallow zone ( $\approx 4 \times 10^3 \text{ ft}^3/\text{s}$ ).

Contaminants measured in 7 shallow perched zone monitoring wells located along Maumee River are given in table below:

Contaminant	Observed Concentration ( ppb)	# Wells Found In	MCL/ DWEL (ppb)	Dilution Factor	Screening Level (ppb)
Pentachlorophenol	4	1	1	1.5 x 10 <sup>5</sup>	1.5 x 10 <sup>5</sup>
Lead	15-19	2	15	"	$2.2 \times 10^6$
Manganese (dissolved)	370-4700	4	880	"	$1.3 \times 10^8$
Manganese (total)	37-5500	6	880	"	$1.3 \times 10^8$
Thallium (dissolved)	10	1	2	"	$3.0 \times 10^{5}$
Thallium (total)	11	1	2	"	$3.0 \times 10^5$

<sup>&</sup>lt;sup>1</sup> AContamination@ and Acontaminated@describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate Alevels@ (appropriate for the protection of the groundwater resource and its beneficial uses).

3.	expected to rem	ion of contaminated groundwater <b>stabilized</b> (such that contaminated groundwater is ain within Aexisting area of contaminated groundwater as defined by the monitoring nated at the time of this determination)?
	_	If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the Aexisting area of groundwater contamination.
	_	If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the Aexisting area of groundwater contamination <sup>®</sup> ) - skip to #8 and enter ANO® status code, after providing an explanation.
		If unknown - skip to #8 and enter AIN@status code.
	Rationale and R	eference(s):

<sup>&</sup>lt;sup>2</sup> Aexisting area of contaminated groundwater@is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of Acontamination@that can and will be sampled/tested in the future to physically verify that all Acontaminated@groundwater remains within this area, and that the further migration of Acontaminated@groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4.	Does Acontaminated@groundwater discharge into surface water bodies?				
	If yes - continue after identifying potentially affected surface water bodies.				
	If no - skip to #7 (and enter a AYE@status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater Acontamination@does not enter surface water bodies.				
	If unknown - skip to #8 and enter AIN@status code.				
	Rationale and Reference(s):				

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5. Is the <b>discharge</b> of <b>A</b> contaminated@groundwater into surface water likely to be <b>Ainsignificant@</b> (i.e., the maximum concentration <sup>n</sup> of each contaminant discharging into surface water is less than 10 times their appropriate groundwater <b>A</b> level,@and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?				
If yes - skip to #7 (and enter AYE@status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration <sup>3</sup> of key contaminants discharged above their groundwater Alevel,@the value of the appropriate Alevel(s),@and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.				
If no - (the discharge of Acontaminated@groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of <u>each</u> contaminant discharged above its groundwater Alevel,@ the value of the appropriate Alevel(s),@and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater Alevels,@the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.				
If unknown - enter AIN@ status code in #8.				

Rationale and Reference(s):

 $<sup>^3</sup>$  As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

Can the <b>discharge</b> of <b>A</b> contaminated@groundwater into surface water be shown to be <b>Acurrently acceptable</b> @(i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented <sup>d</sup> )?						
	If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site-s surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment, appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment appropriate surface water and sediment alevels, as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.					
_	If no - (the discharge of Acontaminated@groundwater can not be shown to be Acurrently acceptable@) - skip to #8 and enter ANO@status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.					
<u> </u>	If unknown - skip to 8 and enter AIN@status code.					

Rationale and Reference(s):

<sup>&</sup>lt;sup>4</sup> Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

<sup>&</sup>lt;sup>5</sup> The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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7.	Will groundwater <b>monitoring</b> / measurement data (and surface water/sediment/ecological data, as				
necessa	y) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or				
vertical	as necessary) dimensions of the Aexisting area of contaminated groundwater?@				
	If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the Aexisting area of groundwater contamination.@				
If no - enter ANO@status code in #8.					
If unknown - enter AIN@ status code in #8.					
	Rationale and Reference(s):				

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8.

Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Co EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).						
<u>YE</u>	YE - Yes, "Migration of Contaminated Greenified. Based on a review of the informate determination, it has been determined that Groundwater" is "Under Control" at the Carlity, EPA ID # OHD 005 050 273, local Specifically, this determination indicates the groundwater is under control, and that mouthat contaminated groundwater remains we contaminated groundwater". This determinated groundwater becomes aware of significant characteristics.	ation contained in this EI the "Migration of Contaminated General Motors Powertrain Defiance ted in Defiance County, Ohio. hat the migration of "contaminated" nitoring will be conducted to confirm ithin the "existing area of nation will be re-evaluated when the				
_	NO - Unacceptable migration of contamor expected.	NO - Unacceptable migration of contaminated groundwater is observed or expected.				
_	IN - More information is needed to make	a determination				
Completed by	(signature) (print) (title)	<u></u>				
Supervisor	(signature) (print) (title) (EPA Region or State)					
U.S. EP 7 <sup>th</sup> Floor 77 W. J	Regerences may be found: PA Region 5, General Motors Powertrain, Det r Records Center fackson Blvd. DIL 60604	fiance Facility				
Contact telephon	ne and e-mail numbers					
(name) (phone (e-mail)	•					

FINAL NOTE: The Human Exposures EI is a Qualitative Screening of Exposures and the Determinations within the Document should not be used as the sole basis for restricting the scope of more detailed (e.g., site-specific assessments of risk.

#### DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

# RCRA Corrective Action Environmental Indicator (EI) RCRIS code (CA725)

#### **Current Human Exposures Under Control**

Facility Name:	General Motors Powertrain-Defiance Foundry				
Facility Address:	26427 State Route 281 East, Defiance, Ohio				
Facility EPA ID #:	OHD 005 050 273				
groundwater, sur	relevant/significant information on known and reasonably suspected releases to soil, face water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste its (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been <b>considered</b> in the second content of the second content in the second content is the second content of the se				
<u>X</u>	If yes - check here and continue with #2 below.				
<u>—</u>	If no - re-evaluate existing data, or				
<del></del>	if data are not available skip to #6 and enterAIN@(more information needed) status code.				
BACKGROUND					

#### <u>Definition of Environmental Indicators (for the RCRA Corrective Action)</u>

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

# <u>Definition of ACurrent Human Exposures Under Control®EI</u>

A positive ACurrent Human Exposures Under Control@EI determination (AYE@status code) indicates that there are no Aunacceptable@human exposures to Acontamination@(i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all Acontamination@subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

# **Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The ACurrent Human Exposures Under Control®EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action programs overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

## **Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e.,

RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

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2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be "**contaminated**" above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	<u>Yes</u>	<u>No</u>	?	Rationale / Key Contaminants
Groundwater		X		
Air (indoors)		X		
Surface Soil (e.g., <2 ft)	X			chloroform, 1,1-dichloroethene
Surface Water		X		
Sediment	X			arsenic, lead
Subsurf. Soil (e.g., >2 ft)	X			chloroform, 1,1-dichloroethene
Air (outdoors)		X		

<sup>2</sup>If no (for all media) - skip to #6, and enter AYE,@ status code after providing or citing appropriate "levels", and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

If unknown (for any media) - skip to #6 and enter "IN" status code.

#### Rationale and Reference(s):

The risk-based screening criteria used for soil/sediment are those of Region 9 PRG's for industrial soil calculated at a Target Cancer Risk (CR) of 1 E-5 and a Target Hazard Quotient (HQ) = 1. Comparison of the data with these screening criteria shows that chloroform and 1,1-dichloroethene have concentrations in surface and subsurface soil under the plant floor near the building footer at AOI 20 that are higher than the screening criteria. These concentrations remain after interim measures to remove free product and contaminated soil. A second interim measure resulted in the removal of PCB-contaminated soil.

The concentrations of arsenic and lead in sediment samples at AOI's 5 and 6, respectively, are also higher than the screening criteria.

The screening criteria for the upper aquifer are MCL's or Drinking Water Equivalent Levels (DWEL) at a CR of 1 E-5 and a HQ = 1.

The perched groundwater is not used as a drinking water supply or for any other

<sup>&</sup>lt;sup>1</sup> AContamination@and Acontaminated@describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based Alevels@(for the media, that identify risks within the acceptable risk range).

<sup>&</sup>lt;sup>2</sup> Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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purpose, therefore screening against MCLs is not appropriate. This aquifer may, however discharge to the Maumee River. Screening levels were calculated to account for this discharge. Concentrations detected in the shallow aquifer are compared to groundwater screening criteria calculated to account for groundwater mixing with surface water in the Maumee River.

No constituents in both groundwater aquifers have concentrations higher than the screening criteria.

The surface water on-site is due to stormwater management units and a ditch. Specific screening levels were calculated for this medium because the exposure is unusual in that it involves worker exposure to surface water. Comparison of detected concentrations to calculated screening levels revealed no exceedences.

Indoor air quality in the room above AOI 20 is not impacted due to the use of an epoxy coating on the floor which prevents vapor intrusion. Outdoor air quality is not impacted.

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3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

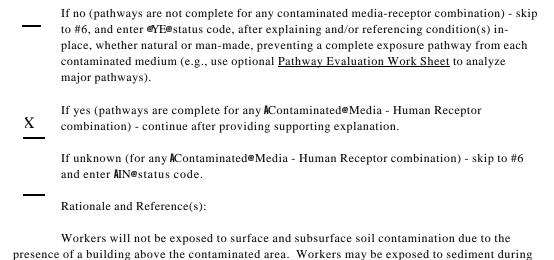
#### Potential **Human Receptors** (Under Current Conditions)

"Contaminated" Media Residents		Workers	Day-Care	Construction	Trespassers	Recreation	$Food^3$	
	Groundwater	-	-	-	-			
	Air (indoors)	-	-	-				
	Soil (surface, e.g., <2 ft)	NO	NO	NO	YES	NO	NO	NO
	Surface Water	-	-			-	-	-
	Sediment	NO	YES			NO	NO	NO
	Soil (subsurface e.g., >2 f	t)			YES			NO
	Air (outdoors)	_	_	_	-	-		

Instructions for **Summary Exposure Pathway Evaluation Table**:

- 1. Strike-out specific Media including Human Receptors=spaces for Media which are not Acontaminated@as identified in #2 above.
- 2. enter Ayes@or Ano@for potential Acompleteness@under each AContaminated@Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential AContaminated@ Media - Human Receptor combinations (Pathways) do not have check spaces (A\_\_\_\_@). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.



<sup>&</sup>lt;sup>3</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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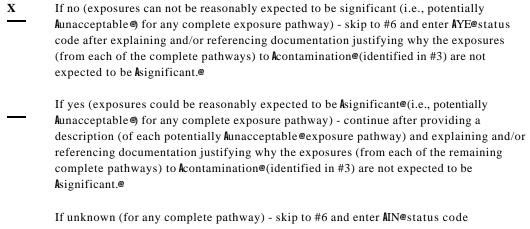
## routine maintenance.

The site is fenced, preventing access by trespassers.

Construction workers may encounter surface and subsurface soil if excavation under the building at AOI 20 were done.

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4.	Can the <b>exposures</b> from any of the complete pathways identified in #3 be reasonably expected to be
	Asignificante* (i.e., potentially Aunacceptable@because exposures can be reasonably expected to be: 1)
	greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the
	acceptable Alevels @(used to identify the Acontamination@); or 2) the combination of exposure magnitude
	(perhaps even though low) and contaminant concentrations (which may be substantially above the
	acceptable Alevels @ could result in greater than acceptable risks)?



Rationale and Reference(s):

The potential exposure to chloroform and 1,1-dichloroethene in soil at AOI 20 is not significant. This area is under a building.

The mean lead concentration in sediment from the RFI samples at AOI 6 does not represent a significant exposure when the difference between the conservative, estimated exposure frequency used in deriving the screening criterion and the actual exposure frequency of workers performing maintenance in that area is taken into account.

<sup>&</sup>lt;sup>4</sup> If there is any question on whether the identified exposures are Asignificant@(i.e., potentially Aunacceptable@) consult a human health Risk Assessment specialist with appropriate education, training and experience.

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5.	Can the Asignificant@exposures (identified in #4) be shown to be within acceptable limits?				
	_	If yes (all Asignificant@exposures have been shown to be within acceptable limits) - continue and enter AYE@after summarizing <u>and</u> referencing documentation justifying why all Asignificant@exposures to Acontamination@are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).			
	_	If no (there are current exposures that can be reasonably expected to be Aunacceptable@-continue and enter ANO@status code after providing a description of each potentially Aunacceptable@exposure.			
	_	If unknown (for any potentially Aunacceptable@exposure) - continue and enter AIN@status code			

Rationale and Reference(s):

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6.	Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):					
	YE	YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the General Motors Powertrain Defiance facility, EPA ID # OHD 005 050 273, located in Defiance County, Ohio under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.				
	_	NO - "Current Human Exposures" are NOT "Under Control."				
	_	IN - More information is need	eded to make a determination.			
	Completed by	(signature) (print) Gary Cyga (title) Project Ma	n nager, U.S. EPA	Date		
	Supervisor	(signature) (print) (title) (EPA Region or State)		Date		
	U.S. EPA Regio 7 <sup>th</sup> floor Rcords	References may be found: a 5, General Motors Powertrain, Center vd., Chicago, IL 60604	Defiance Facility			
	Contact telephor	e and e-mail numbers				
	(name)	Gary Cygan				
	(phone	#) 312 886 5902				
	(e-mail	cygan.gary@epa.go	V			

FINAL NOTE: THE HUMAN EXPOSURES ELIS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.